## Item #14: Moose and Mountain Goat Populations

**Evaluation Objectives:** To evaluate the changes in the population status of moose and mountain goats on the forest and the relationship of population changes to forest management practices.

**Methods**: Moose and mountain goat populations are monitored using Montana Fish, Wildlife & Parks (FWP) permit, harvest data, and aerial counts. The Flathead National Forest participated in a partnership in 2005 with FWP for goat monitoring. State hunting district (HD) boundaries for moose and mountain goats differ from each other and differ from the general HDs used for deer and elk. Harvest numbers are reported from those HDs that overlap National Forest System (NFS) lands. Hunting districts for moose are from a low of about 14% NFS lands in HD 112 up to 100% in HD 150. Hunting Districts for goats have a higher percentage of NFS lands and range from about 60% for HD 131 and 95 - 100% for the remaining HDs. It is assumed, due to the habitat preferred by moose and mountain goats, all hunting within the HDs occurs on the forest. Moose and mountain goat harvest data have a lower error rate in that all hunters are permitted, the permit numbers are few in number, and permits are HD specific. Harvest information up to 2010 is found at http://fwp.mt.gov/hunting/planahunt/harvestReports.html.

**Evaluation:** Moose harvest data are reported for the 2007-2010 period (Table14-1), 1998 - 2006 period (Table 14-2), and 1986-1997 period (Table 14-3). Harvested moose numbers tend to be higher in the northern portions of the forest, the North Fork of the Flathead River Drainage and the Tally Lake Ranger District. Moose harvest has decreased from the early 1990s when highs were due to an increase in the number of permits and harvest allowed, and also from a more accurate monitoring of the Native American harvest.

Mountain goat harvest data from the forest are reported for the 2007 - 2010 period (Table 14-4), 1998 - 2005 period (Table 14-5) and from the 1986 – 1997 reporting period (Table 14-6). Mountain goats are associated with high elevation rocky terrain and tend to occur at low numbers across the more remote portions of the forest. The highest goat numbers occur along the mountain range dividing the South and Middle Forks of the Flathead River.

**Table 14-1**. Estimated Moose Harvest on Forest by Hunting District From 2007 to 2010.

| Year | 110 | 111 | 112 | 130 | 140 | 141 | 150 | Total Harvest from Hunting Districts within NFS lands |
|---|---|---|---|---|---|---|---|---|
| 2007 | 12 | 9 | 4 | 2 | 4 | 3 | 2 | 36 |
| 2008 | 10 | 5 | 5 | 3 | 3 | 3 | 1 | 30 |
| 2009 | 11 | 10 | 5 | 0 | 4 | 4 | 0 | 34 |
| 2010 | 9 | 9 | 2 | 0 | 1 | 2 | 1 | 24 |
| **Ave** | | | | | | | | **31** |

**Table 14-2**. Estimated Moose Harvest on Forest by Hunting District From 1998 to 2006.

| Year | 110 | 111 | 112 | 130 | 140 | 141 | 150 | Total Harvest from Hunting Districts within NFS lands |
|---|---|---|---|---|---|---|---|---|
| 1998 | 9 | 17 | 12 | 4 | 3 | 4 | 2 | 51 |
| 1999 | 7 | 15 | 5 | 4 | 4 | 5 | 2 | 42 |
| 2000 | 7 | 17 | 4 | 4 | 5 | 2 | 1 | 40 |
| 2001 | 6 | 14 | 3 | 2 | 5 | 2 | 1 | 33 |
| 2002 | 8 | 9 | 5 | 4 | 5 | 5 | 1 | 37 |
| 2003 | 10 | 8 | 3 | 2 | 4 | 5 | 1 | 33 |
| 2004 | 10 | 9 | 4 | 4 | 4 | 5 | 2 | 38 |
| 2005 | 9 | 9 | 5 | 2 | 5 | 4 | 1 | 35 |
| 2006 | 12 | 9 | 5 | 5 | 3 | 5 | 1 | 40 |
| **Ave** | | | | | | | | **39** |

**Table 14-3**. Estimated Moose Harvest on Forest by Hunting District from 1986 to 1997.

| Year | 110 | 111 | 112 | 130 | 140 | 141 | 150 | Total Annual Harvest from Hunting Districts within NFS lands |
|---|---|---|---|---|---|---|---|---|
| 1986 | 21 | 24 | 3 | | 4 | 4 | | 56 |
| 1987 | 21 | 20 | 4 | | 4 | 6 | | 55 |
| 1988 | 16 | 18 | 8 | | 5 | 8 | | 55 |
| 1989 | 23 | 32 | 11 | | 7 | 6 | | 79 |
| 1990 | 34 | 32 | 12 | 3 | 15 | 4 | | 100 |
| 1991 | 27 | 35 | 12 | 3 | 13 | 9 | | 99 |
| 1992 | 32 | 46 | 10 | 3 | 16 | 7 | | 114 |
| 1993 | 30 | 40 | 13 | 3 | 13 | 7 | | 106 |
| 1994 | 29 | 39 | 13 | 3 | 13 | 5 | | 102 |
| 1995 | 30 | 35 | 12 | 2 | 7 | 8 | | 94 |
| 1996 | 24 | 23 | 6 | 3 | 8 | 5 | 1 | 70 |
| 1997 | 13 | 27 | 13 | 3 | 4 | 7 | 2 | 69 |
| **Ave** | | | | | | | | **81** |

**Figure 2 – Moose Harvest on the Flathead NF from 1986 to 2010**

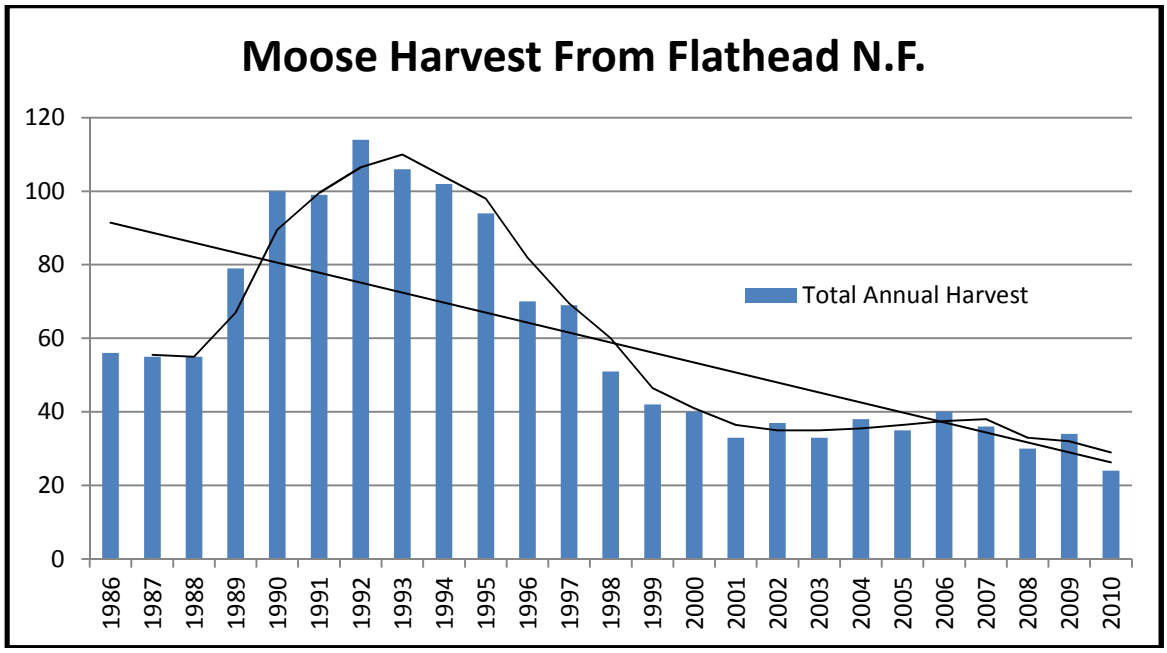



**Table 14-4**. Mountain Goat Harvest on Flathead National Forest by Hunting District (HD) from 2008-2010.

| Year | 131 | 132 | 133 | 134 | 140 | 141 | 142 | 150 | 151 | Annual Harvest from HD within NFS lands |
|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 5 | 1 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 16 |
| 2008 | 4 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 17 |
| 2009 | 5 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 17 |
| 2010 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 14 |
| **Ave** | | | | | | | | | | **16** |

**Table 14-5**. Mountain Goat Harvest on Flathead National Forest by Hunting District (HD) from 1998-2005.

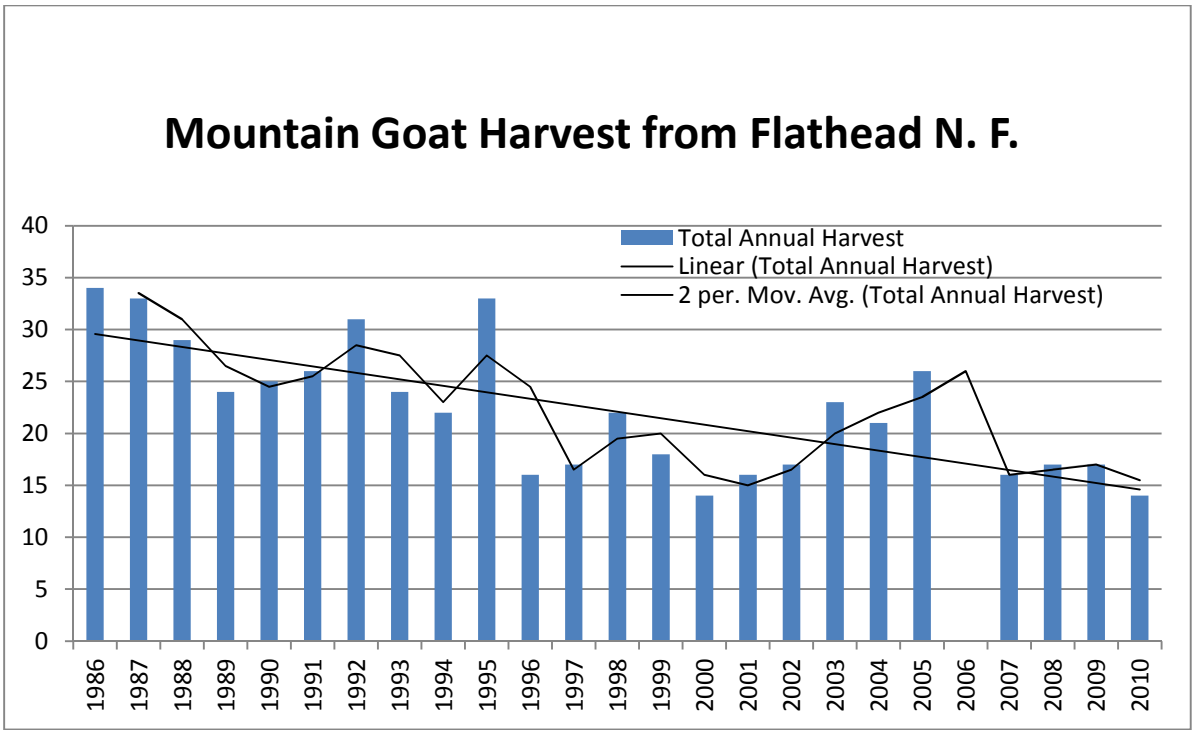
| Year | 131 | 132 | 133 | 134 | 140 | 141 | 142 | 150 | 151 | Annual Harvest from HD within NFS lands |
|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 2 | 5 | 4 | 0 | 2 | 3 | 3 | 1 | 2 | 22 |
| 1999 | 1 | 3 | 4 | 1 | 1 | 3 | 1 | 2 | 2 | 18 |
| 2000 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 14 |
| 2001 | 2 | 3 | 3 | 1 | 2 | 2 | 0 | 2 | 1 | 16 |
| 2002 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 17 |
| 2003 | 5 | 4 | 3 | 1 | 2 | 3 | 3 | 1 | 1 | 23 |
| 2004 | 4 | 1 | 3 | 2 | 0 | 4 | 2 | 2 | 3 | 21 |
| 2005 | 2 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | 3 | 26 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | | | | | | | | Data | not | available |
| **Ave** | | | | | | | | | | **20** |

**Table 14-6**. Mountain Goat Harvest on Flathead National Forest by Hunting District (HD) from 1986 to 1997.

| Year | 131 | 132 | 133 | 134 | 140 | 141 | 142 | 150 | 151 | Annual Harvest from HD within NFS lands |
|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 8 | 10 | 2 | 0 | 1 | 5 | 5 | 0 | 3 | 34 |
| 1987 | 8 | 3 | 6 | 1 | 2 | 8 | 4 | 1 | 2 | 33 |
| 1988 | 8 | 4 | 7 | 0 | 2 | 3 | 4 | 1 | 1 | 29 |
| 1989 | 4 | 3 | 6 | 0 | 1 | 3 | 4 | 2 | 3 | 24 |
| 1990 | 4 | 2 | 3 | 2 | 2 | 6 | 1 | 2 | 2 | 25 |
| 1991 | 5 | 4 | 4 | 2 | 2 | 5 | 1 | 2 | 0 | 26 |
| 1992 | 7 | 4 | 3 | 2 | 1 | 7 | 2 | 2 | 3 | 31 |
| 1993 | 1 | 2 | 4 | 2 | 0 | 7 | 3 | 2 | 3 | 24 |
| 1994 | 4 | 1 | 4 | 2 | 1 | 4 | 2 | 1 | 3 | 22 |
| 1995 | 4 | 2 | 5 | 2 | 1 | 3 | 2 | 1 | 1 | 33 |
| 1996 | 4 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 16 |
| 1997 | 2 | 5 | 3 | 1 | 2 | 1 | 2 | 1 | 0 | 17 |
| **Ave** | | | | | | | | | | **26** |

**Figure 2 – Mountain Goat Harvest on the Flathead NF From 1986 to 2010**



Since 1941, FWP has used post-season surveys of licensed hunters and permit holders as well as winter transect surveys to estimate wildlife harvest and population trends. Results of these surveys are used to develop hunting season regulations, evaluate and develop wildlife management strategies, develop wildlife research, and for hunting planning by the public. The number of permits allowed and harvest levels for moose and mountains goats is strictly controlled and should indicate FWP estimates of population trends for these species.

The number of moose permits issued and moose harvested have decreased since 1992, and may suggest a decreasing population. FWP has reported that from 1993 until about 1998, drought, severe winters and other factors caused the moose calf/cow ratio to drop to about 12 to 15 calves for every 100 cows. The ratios have now risen to 35-40:100 which translate into a steadily rising population.

The number of permits issued and mountain goats harvested have remained relatively stable over the 1998 - 2005 period for mountain goats, and may suggest a stable population. However, these harvest numbers are lower harvests than the 1986 - 1997 reporting period.

The major fires of 2000 and 2003 created conditions that reduced canopy snow capture, thermal cover, and security cover for approximately 30 years over thousands of acres on and adjacent to the forest, caused an immediate and short-term reduction in forage, but will create increased big game forage values for the next approximately 30 years. Vegetation management, wildfires and fire use for resource values should continue to provide a diversity of habitats required for both species; moose a habitat generalist, and goats which are generally limited to fairly remote and hard to access locations.

**Recommended Action:** Short term game population changes are largely attributable to the designing and enforcement of hunting regulations within hunting districts, coupled with the effects of extreme weather. The FNF should 1) continue to coordinate project proposals with FWP for technical advice and to arrive at site specific objectives for the affected habitat, 2) partner with FWP to monitor populations as cooperative resources are requested, 3) continue to conduct analysis to review programs and activities at a landscape level to determine potential effects, and 4) provide for habitat connectivity, riparian management and access management at the project and landscape levels. Rejuvenating shrub fields by prescribe burns, allowing natural fires to burn under prescriptions in high elevations, and create selected openings through timber management would benefit these species by creating a diversity of habitat and forage conditions.